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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

### Office Action Summary

**Application No.**

10/587,809

**Applicant(s)**

POTTIER ET AL.

**Examiner**

Darcy D. LaClair

**Art Unit**

1796

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 38 - 62 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 38-62 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/55/08)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities:

On page 1, line 14, "ifself" appears to be a typographical error.

The specification recites "none crepe hardening effect occurs" on p. 12 line 1-2.

This is poor grammar, and should be revised.

Appropriate correction is required.

### ***Claim Objections***

2. **Claim 51** is objected to because of the following informalities: It is not immediately clear whether the optional portion of the definition of X is intended to refer to "Cl or a silanolate radical" or only to "Cl." Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claim 55** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 55** recites the limitation "where step a) further comprises dry impregnation of the precipitated silica, under solid form, by the hydrophobing silicon oil, the hydrophobing silicon oil being not under aqueous emulsion form" in the process

according to Claim 54. The process according to claim 54 recites where the step a) further comprises the addition of the organosilane hydrophobing compound to an aqueous suspension or slurry of the precipitated silica. It is not understood how a process requiring addition of the organosilane hydrophobing compound to an **aqueous** suspension or slurry of precipitated silica can further comprise **dry impregnation** of the precipitated silica under solid form. It appears from the specification, p. 7 line 14-15, that these are two separate variants.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 38-41, 50-51, and 53-54, 56** are rejected under 35 U.S.C. 102(b) as anticipated by **Parmentier et al. (US 5,009,874)**.

**With regard to Claim 38**, Parmentier teaches a hydrophobic precipitated silica particulate adapted as a reinforcing filler material for silicone elastomers. (See abstract) Parmentier teaches that the particles are formed by admixing a silica suspension, a hydrophobing agent, and an organic solvent (see col 1 line 65-68); the hydrophobing agent may be any known agent, (see col 3 line 29) with organosilicic compounds such as those of the general formula  $(R_3Si)_aZ$ , which are consistent with applicant's organosilanes. (See col 3 line 30-59) This is consistent with applicant's step a). The

silica is then incorporated into the compositions, (see col 6 line 50-54), and vulcanized at ambient temperature (see col 6 line 24-25). Parmentier exemplifies mixing polydimethylsiloxane gum (silicone elastomer) and 20 g of silica in a cylinder mixer. (see col 8 line 40-44) As there is no note as to elevated temperatures used in this step, the examiner takes the position that this was done at room temperature, or by cold mixing, (see applicant's definition of cold mixing p. 2 line 32-33) rather than at elevated temperatures. For the silica particulates, Parmentier teaches a BET surface area from 50 to 350 m<sup>2</sup>/g (see col 2 line 67), a water wettability or hydrophobization index I of at least 20%, (see col 2 line 22-24) based on the equation  $I = [V/(V+50)] \times 100$ , which is consistent with applicant's formula (see applicant's p. 4 line 11). The example provides particles with a wettability of 70%, (See col 7 and col 8 Tables for Example 1 and Example 2) within applicant's range.

With regard to the sulfur content, Parmentier does not disclose a sulfur content in the silica particles, however the specification notes that silica may contain salts such as sodium sulfate (Na<sub>2</sub>SO<sub>4</sub>) as a result of neutralization of alkaline silicates with sulfuric acid. (see col 4 line 57-60) Parmentier indicates that in this case, a further stage of the process includes washing to eliminate these impurities, which allows a very low residual sodium content to be attained. (See col 4 line 61-68) In the Examples, Parmentier notes that the sodium content is 440 ppm, which is in the trace range. (See col 7 and col 8 Tables for Example 1 and Example 2) Parmentier has indicated that the sulfate is linked with the sodium content (via sodium sulfate - Na<sub>2</sub>SO<sub>4</sub>). The molecular weight of sodium is 22.99 grams per mol, and the molecular weight of sulfur is 32.06 grams per

mol; there are two moles of sodium for every mol of sulfur. Therefore per 46 grams of sodium, there would be only 32.06 grams of sulfur, or 70% as much sulfur as sodium. This would place the content of sulfur at or below 440 ppm, or around 307 ppm. This is 0.044% or less of sulfur, more specifically, around 0.03%. This is well below the 0.1% required by applicant. Case law holds that a material and its properties are inseparable. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)

**With regard to Claim 39**, Parmentier exemplifies a BET surface of  $170 \text{ m}^2/\text{g}$ , which is within applicant's required range. (See Example 1, 2, Tables col 7 and 8) Parmentier also teaches a preferred BET range from 100 to  $300 \text{ m}^2/\text{g}$ , (see col 2 line 68) which overlaps with sufficient specificity to teach applicant's mandatory claimed range, 60 to  $250 \text{ m}^2/\text{g}$ . Furthermore, as the range 65 –  $150 \text{ m}^2/\text{g}$  is recited as "optional" this is not required to meet the limitations of the claim.

**With regard to Claim 40**, Parmentier exemplifies a water wettability of 70%, (See Example 1, 2, Tables col 7 and 8) which is within applicant's claimed range. Parmentier teaches a water wettability of at least 20%, preferably from 40% to 80%. (See col 2 line 22-24) This overlaps with sufficient specificity to teach applicant's claimed range of 10 to 75.

**With regard to Claim 41**, Parmentier exemplifies a pretreated silica having a sodium content of 440 ppm. This is consistent with 0.044% or less of sulfur, and more specifically around 0.03% of sulfur. (See discussion, above, with regard to **Claim 38**)

**With regard to Claim 50 and 51**, Parmentier teaches organosilicic compounds of the general formula  $(\text{R}_3\text{Si})_a\text{Z}$ . For  $a = 1$ , this is consistent with applicant's formula

where applicant's  $n = 3$ . Parmentier teaches that R is a monovalent hydrocarbon radical, identical or different, and Z is a halogen or -OH, or -OR, which are consistent with a halogen or alkoxy radical. (see col 3 line 33-59) The exemplary compounds include trimethylsilane, trimethylchlorosilane, trimethylethoxysilane, and others. (see col 42-59) These are compounds which have R = alkyl, vinyl, and specifically, methyl or ethyl, and Z= halogen, namely chlorine. Furthermore, Parmentier teaches and exemplifies dimethyldichlorosilane. (See col 3, line 49, 58, and col 7 line 28-29, 62). Dimethyldichlorosilane is consistent with the formula  $R_nSiX_{(4-n)}$  where R is methyl, X is the halogen radical Cl, and n is 2. This specific embodiment meets the requirements set forth by applicant in these claims.

**With regard to Claim 53**, Parmentier teaches and exemplifies dimethyldichlorosilane. (See col 3, line 49, 58 and col 7 line 28-29, 62)

**With regard to Claim 54**, Parmentier exemplifies stabilizing the pH with sodium hydroxide to maintain the pH at a value of 8. (See col 7 line 30-33), and later, lowering the pH to 6 (see col 7 line 35). This constitutes essentially neutral, as well as slightly basic conditions. It is also consistent with applicant's pH treatment of the silica. (see applicant's p. 13 line 8, and line 14) Furthermore, Parmentier teaches that it is advantageous to maintain the pH of the mixture following the mixing of the silica suspension and the hydrophobing agent, in order to avoid the release of noxious gas. (See col 4 line 12-20) This directs the reader with sufficient specificity to a neutral or basic pH.

**With regard to Claim 56**, Parmentier teaches polysiloxanes of the formula  $R_nSiO_{(4-n)/2}$ , where R is a nonhydrolyzable hydrocarbon group which may be an alkyl, halogenated alkyl radical, cycloalkyl, halogenated cycloalkyl, aryl, alkylaryl, halogenated aryl, cyanoalkyl, and n is an integer 0-3, including 2, as well as  $Z_xR_ySiO_{(4-x-y)/2}$ , where Z is a hydrogen, alkenyl, hydroxyl, hydrolysable atom, or a hydrolysable group, and x is an integer 0-3, (See col 5 line 30-53) A variety of compounds are disclosed (see col 5, line 55- col 6 line 7), however the exemplified compound is polydimethylsiloxane gum (see col 8 line 42). This has an unsubstituted monovalent hydrocarbon group of 1 carbon, n (applicant's "p") is 2, and R (applicant's  $R^1$ ) is methyl. This embodiment meets the requirements of applicant's claim limitations.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 38-41, 50-51, and 53-54, 56** are rejected under 35 U.S.C. 103(a) as obvious over **Parmentier et al. (US 5,009,874)**.

The discussion with respect to what Parmentier discloses, as set forth in **paragraph 4** above, is incorporated here by reference. It is observed that, although, all of the cited claims stand properly rejected as anticipated over Parmentier as set forth in **paragraph 4**, if there is any difference at all between the claims and Parmentier it is,



possibly, with respect to the issue of whether the claimed requirement of the sulfur content being lower than 0.1 wt % (cf. **Claim 38**) is disclosed with sufficient specificity in the cited reference. While the examiner believes it does, nevertheless, in the interests of building a complete prosecution record in the present application, it is urged that the sulfur content limitation in the present claims would also have been obvious over Permentier as explained below.

With regard to the sulfur content, Permentier does not disclose a sulfur content in the silica particles, however the specification notes that silica may contain salts such as sodium sulfate ( $\text{Na}_2\text{SO}_4$ ) as a result of neutralization of alkaline silicates with sulfuric acid. (see col 4 line 57-60) Permentier indicates that in this case, a further stage of the process includes washing to eliminate these impurities, which allows a very low residual sodium content to be attained, (see col 4 line 61-68) however Permentier does not explicitly disclose the content of sulfur. Elimination means to reduce entirely, or to reduce as much as possible within an economically feasible manner, the content of a contaminant. It would be obvious to one of ordinary skill in the art, given Permentier's instruction to eliminate the impurities, including a sulfur compound, to reduce the content of sulfur as much as possible. Given the ranges in which Permentier's impurities (sodium) are reported, one of ordinary skill in the art would be expected to reduce the content of other impurities into the ppm range, which would be below applicant's required 0.1% sodium.

In view of the above discussion of how Permentier discloses the sulfur content as well as the discussion of the manner in which Permentier discloses limitations other

than the sulfur content in the cited claims as explained in the **paragraph 4** it would therefore have been obvious to one of ordinary skill in the art that the disclosure of Permenetier renders obvious the cited present claims.

6. **Claims 42-49, 52, and 55** are rejected under 35 U.S.C. 103(a) as obvious over **Parmentier et al. (US 5,009,874)** in view of **Panz et al. (US 2003/0181565)** with **evidence** provided by **Igarashi et al. (US 2005/0165161)**.

The discussion of **Parmentier**, above in **paragraph 4**, and particularly the discussion of **Claims 38, 41, 50, and 54**, is incorporated here by reference.

**With regard to the combination of these references**, **Parmentier** teaches a hydrophobic, essentially spheroidal precipitated silica, which is obtained by treating with a hydrophobing agent. (See abstract, discussion above, in paragraph 3). Likewise, **Panz** teaches a hydrophobic silica obtained by hydrophobizing. **Panz** furthermore provides a silica which possesses an extremely high level of whiteness. (See abstract) The silica of **Panz** appears to be equally capable of being treated and used in a silicone rubber. It would be obvious to use the silica of **Panz** in the invention of **Parmentier**, in order to obtain an improved whiteness, which would contribute to reduced discoloration and an improved product appearance. Furthermore, based on the similarity of the materials, aims and methods in each, both references are in the same field of endeavor and it is expected that a practitioner in the field would be aware of the advances in each, therefore it would be obvious to one of ordinary skill in the art to incorporate improvements from **Panz** in the methods of **Parmentier**.

**With regard to Claim 42**, Parmentier exemplifies placing 35 kg of silica slurry containing 25% by weight of silica (8.75 kg) in 60 liters of water, with 113 g/minute over 25 minutes (1.75 kg) of dimethyldichlorosilane added simultaneously with sodium hydroxide to maintain the pH at a value of 8. (See col 7 line 22-33) This is a ratio of silica to hydrophobing oil of 20%. This is similar in procedure to applicant's Example 1, which provides 500 g of precipitated silica in 500 g (0.5 L) of water, and dimethyldichlorosilane introduced during 25 min, while maintaining the pH at 8. (See applicant's p. 13, Example 1 line 4-14) The base silica of Panz has a BET surface area from 150 m<sup>2</sup>/g - 170 m<sup>2</sup>/g prior to hydrophobing. (See par [0113], Table) Specifically, Applicant exemplifies Z132 as the silica in Example 1 (see p. 13). The same silica without any treatment has a BET of 199 m<sup>2</sup>/g. (See Igarashi p. 5 Table 1, Comparative Example 1) The similar pre-treatment BET of these silicas suggest that there is a similar surface area on the pre-treatment silica upon which the hydrophobic moieties can be attached. Applicant teaches a weight ratio for silicon oil/silica between 5% and 20%. (See applicant's p. 7 line 5) Parmentier is contacting 20% dimethyldichlorosilane, the same hydrophobing agent, relative to the silica; This is at the upper end of applicant's taught range. Parmentier also uses the same pH and mixing steps, number of grafted hydrophobing groups. The carbon content of the silica appears to be derived from the treatment process; therefore the amount of carbon associated with the silica would be in a similar range as described by applicant in Example 1. As applicant's example is consistent with the claimed ranges, it is expected that Parmentier's Example 1, using the silica of Panz would likewise meet the requirements of these claims with

respect to carbon content. Furthermore, Panz teaches that thickening action in precipitated silicas is attributable to a low carbon content of less than 3.1%, (see par [0015]) and teaches a carbon content for the inventive silicas of above this value, or preferably above 5.0% (see par [0021], p. 2 table, and par [0031]) It would be obvious to one of ordinary skill in the art, even if the process of Parmentier does not confer a sufficiently high carbon content, to alter the process using the teachings of Panz to obtain a value greater than 3.1%.

**With regard to Claim 43**, the surface area for binding of hydrophobic moieties and the added content of dimethyldichlorosilane will determine the amount of dimethyldichlorosilane bound to the silica particles. (See the discussion of **Claim 42**, above.) Parmentier's example 1, using the silica of Panz, would have a similar amount of dimethyldichlorosilane added to the reaction mix, and a similar available BET surface area of the particles, to which this hydrophobing agent could bind. This combination would be expected to have a BET parameter C in a similar range to that presented in Applicant's example 1. As this reported as 22, the BET parameter C of the silica of Panz, treated according to Parmentier, is expected to be within this range, which is well below the parameter C of 80 required by applicant's claim.

**With regard to Claim 44**, Parmentier does not teach silica having a mean particle size lower than 30  $\mu\text{m}$ . Panz teaches that the silica may be ground to give a particle size of 8-25  $\mu\text{m}$ . (see par [0080])

**With regard to Claim 45 and 46**, Parmentier exemplifies a silica particulate having a water uptake of 3%, measured under a humidity of 64%, at 23°C. This is

below the water uptake described by applicant at a relative humidity of 51% or 71%. Although the measurement conditions vary slightly, it is the examiner's position that the values are close enough that one of ordinary skill in the art would have expected the same properties. Case law holds that a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Specifically, the hydrophobing of the silica by Parmentier's process appears to be sufficiently effective that the reduction in water uptake in humid conditions would meet the requirements set forth by applicant.

**With regard to Claim 47 and 48**, Parmentier teaches that the silica of the invention may have a BET surface area from  $50\text{ m}^2/\text{g}$  to  $350\text{ m}^2/\text{g}$ , and preferably from 100 to  $300\text{ m}^2/\text{g}$ , (see col 2 line 65-68) and exemplifies a BET surface area of  $170\text{ m}^2/\text{g}$  (see col 7 line 52). The CTAB surface area can be from  $40\text{ m}^2/\text{g}$  to  $320\text{ m}^2/\text{g}$ , and preferably from 80 to  $270\text{ m}^2/\text{g}$ . Within this range, a difference between the respective surface area measurements of  $25\text{ m}^2/\text{g}$  can be obtained. This reflects the properties of the silica after treatment. It appears that the treatment causes a reduction in the BET specific surface area. Specifically, Applicant shows a BET specific surface area of  $79\text{ m}^2/\text{g}$  for Z132 in Example 1 (see p. 13, Table), after treatment. The same silica without any treatment has a BET of  $199\text{ m}^2/\text{g}$  (and CTAB of  $124\text{ m}^2/\text{g}$ ). (See Igarashi p. 5 Table 1, Comparative Example 1) While Parmentier discloses a treated range which significantly overlaps with that required by (see Claim 38-39) and taught by applicant

(see p. 3 line 15), it is not clear that Parmentier's taught and particularly exemplified pre-treated silica also significantly overlaps with applicant's pre-treated silica, because there appears to be a significant decrease in the BET surface area during the treatment process. Panz teaches a treated BET surface area of 50 - 110 m<sup>2</sup>/g, and a CTAB surface area of greater than 30, or 30 - 110 m<sup>2</sup>/g. (See par [0021], [0031]) The particle size and final BET surface area of the silica of Panz is consistent with the invention of Applicant. Additionally, the initial BET surface area exemplified by applicant is consistent with the initial BET surface area of Applicant. (See discussion of **Claim 42**, above) This suggests that the silica particles taught by Panz and by Applicant are roughly similar. Furthermore, a BET/CTAB ratio between 1 and 3 is taught. (See par [0031]) At a ratio of 3,  $BET = 110 / CTAB = 36.7$ ; and at a ratio of 2,  $BET = 110 / CTAB = 55$ . In the middle of the range, at a ratio of 2,  $BET = 80 / CTAB = 40$ . Each of these, which are within the range and characteristics taught by Panz, presents a difference of greater than 25 m<sup>2</sup>/g. While these reflect post-treatment ranges, it is expected that the difference in surface area would not change sufficiently during treatment to preclude pre-treatment values which are consistent with applicant's requirements.

**With regard to Claim 49**, Parmentier indicates a further stage of the process includes washing **prior** to treatment to eliminate impurities, which allows a very low residual sodium content (consistent with reduced sodium sulfate content) to be attained, (See col 4 line 61-68) and exemplifies a silica believed to contain 0.044% or less of sulfur, more specifically, around 0.03%. Attention is drawn to the discussion of **Claim 38**, above, for further details. Because this washing is done **PRIOR** to the treatment,

then the sulfur content would be established in the pre-treated silica. Furthermore, as Parmentier teaches that the washing is designed to *eliminate* the impurities, such as sodium sulfate (see col 4 line 61-63), one of ordinary skill in the art would be motivated to reduce the content of these impurities, including sulfur, as much as possible, to the point where only trace amounts are present.

**With regard to Claim 52**, Parmentier exemplifies dimethyldichlorosilane as the hydrophobing compound, which is identical to applicant's exemplified hydrophobing compound, in a process similar to that of applicant. (See discussion above, with regard to **Claim 42**) When used in conjunction with the silica of Panz, the BET surface area and hydrophobing compound are significantly similar to that of applicant. This is expected to yield similar results, namely a pretreated silica with a similar organic graft number as that exemplified by applicant. As applicant's example demonstrates a graft number of  $6.5/\text{nm}^2$  for dimethyldichlorosilane ( $n=2$ ), which is well in excess of the required graft number of greater than 3, it is expected that the combination of the silica of Panz with the method of Parmentier's Example 1 will generate a product which meets the requirements of this claim.

**With regard to Claim 55**, Parmentier does not disclose a dry impregnation step. Panz discloses that the process of the invention, namely hydrophobing silica particles, may be conducted by several variants, (see par [0051]) such as mixing of dry precipitated silica with polysiloxane (a hydrophobing agent) in a Gericke mixer. (see par [0056]) It would be obvious to one of ordinary skill in the art that this process could be

undertaken with any organopolysiloxane, such as that presented by Parmentier. (See discussion of Claim 50, above)

7. **Claims 57-61** are rejected under 35 U.S.C. 103(a) as obvious over **Parmentier et al. (US 5,009,874)** in view of **Itoh et al. (US 3,862,081)**.

The discussion of **Parmentier**, above in **paragraph 4**, and particularly the discussion of **Claim 56**, is incorporated here by reference.

**With regard to Claim 57**, Parmentier discloses polysiloxanes of formula  $R_nSiO_{(4-n)/2}$  and  $Z_xR_ySiO_{(4-x-y)/2}$ , (see col 5 line 30-53) and exemplifies polydimethylsiloxane gum (see col 8 line 42). In the second formula, Z may be an alkenyl group, however a particular ratio of incorporation for this group is not disclosed. Itoh teaches a silicone rubber composition having excellent self-extinguishability, mechanical strength, and heat resistance, (see abstract) having 100 parts by weight of organopolysiloxane gum which consists of 99.8 mol percent of dimethylsiloxane, and 0.2 mol percent of methylvinylsiloxane ( $CH_3(CH_2=CH)SiO$  unit). This is combined with Aerosil 200, a fumed silica. (See col 4 line 22-26). It would be obvious to one of ordinary skill in the art to use the organopolysiloxane of Itoh in the invention of Parmentier in order to obtain the benefits of improved fire and heat resistance, as well as mechanical strength. Furthermore, the hydrophobing of precipitated silica provides a less expensive alternative to the fumed silica of Itoh. It would be obvious to one of ordinary skill in the art to contrive a combination which would reduce the cost while improving or maintaining to properties achieved by the silica filler.



**With regard to Claim 58**, Itoh teaches that the polysiloxane gum has a polymerization degree of 10,000. (See col 4 line 23) Itoh teaches that the organopolysiloxane may have hydroxyl, trimethylsilyl, or dimethylvinylsilyl radicals at the terminals. (See col 2 line 46-47) This is a sufficiently small group that it would be obvious to one of ordinary skill in the art to select hydroxyl terminal groups.

**With regard to Claim 59**, Parmentier exemplifies mixing polydimethylsiloxane gum (silicone elastomer) and 20 g of silica in a cylinder mixer. (see col 8 line 40-44) As there is no note of elevated temperatures used in this step, the examiner takes the position that this was done at room temperature, or by cold mixing, (see applicant's definition of cold mixing p. 2 line 32-33), not at elevated temperature. Likewise, Itoh teaches kneading by a two-roll kneader, and then heating, (see col 4 line 28) suggesting that the kneading is performed at room temperature. Both Parmentier and Itoh disclose similar mixing steps. It would therefore be obvious to one of ordinary skill in the art to use cold mixing. While the limitation regarding the absence of process aid or plasticizer is optional, and therefore is not required to meet the limitations of the claim, Parmentier teaches an optional antistructural agent, or plasticizer, in a proportion of 0 to 20 parts. (See col 6 line 61, 64-67) Zero parts is consistent with the absence of the process aid.

**With regard to Claim 60**, Parmentier exemplifies blending the composition for 5 minutes while adding the silica, kneading for 15 minutes prior to adding another compound, and then homogenizing for another 5 minutes. (See col 8 line 5—58) This is a total of 25 minutes, or .41 hours.

**With regard to Claim 61**, Itoh teaches a composition which is substantially similar to that exemplified by applicant, namely:

Compound	Applicant	Itoh
Dimethylsiloxane	99.825 mol%	99.8 mol%
Methylvinylsiloxane	0.15 mol%	0.2 mol%
Dimethylvinylsiloxane	0.025 mol%	-
Degree of polymerization	8,000	10,000
Content of Silica	40 parts	30 parts

The properties of Itoh's composition are consistent with the compositions demonstrated by applicant. (See Itoh col 4 line 51-56, Applicant p. 18 Table 1) Furthermore, the use of Itoh's polysiloxane in the invention of Parmentier would bring the properties even more closely in line, because the silica would be treated in the same way, insuring the same interaction of the silica particles with the polysiloxane polymer. Based on the similarities in the properties of Itoh's polymer, even in the absence of the silica of Parmentier, it appears that similar properties, such as plasticity, would be expected. It is the examiner's position that the values are close enough that one of ordinary skill in the art would have expected the same properties. Case law holds that a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

8. **Claims 61 and 62** are rejected under 35 U.S.C. 103(a) as obvious over **Parmentier et al. (US 5,009,874)** in view **Panz et al. (US 2003/0181565)** and of **Itoh et al. (US 3,862,081)** with *evidence* provided by **Igarashi et al. (US 2005/0165161)**.

The discussions of **Parmentier, Panz, Itoh, and Igarashi**, above in **paragraphs 4-6**, and **Claim 59**, above in **paragraph 6**, are incorporated here by reference.

**With regard to Claim 61**, Itoh teaches a composition having properties consistent with the compositions demonstrated by applicant. (See Itoh col 4 line 51-56, Applicant p. 18 Table 1) Furthermore, the use of Itoh's polysiloxane in the invention of Parmentier in view of Panz would bring the properties even more closely in line, because the silica would be of the same size and BET surface area and would be treated in the same way, insuring the same interaction of the silica particles with the polysiloxane polymer, and the same behavior based on size and mixing. Based on the similarities in the properties of Itoh's polymer, even in the absence of the silica of Parmentier in view of Panz, it appears that similar properties, such as plasticity, would be expected. It is the examiner's position that the values are close enough that one of ordinary skill in the art would have expected the same properties. It would be obvious to use the polysiloxane of Itoh with the silica of Parmentier in view of Panz in order to obtain both the benefits of the improved silica as well as the benefits of the improved polysiloxane composition. (See discussions above for the specifics of each.)

**With regard to Claim 62**, Panz teaches that the thickening action of known hydrophobic precipitated silicas is attributable to the low carbon content or inhomogeneous hydrophobing, (See par [0015]) and that such thickening, and

afterstiffening is not desirable. (see par [0011]) Furthermore, Parmentier teaches a antistructuring agent which helps to prevent hardening during storage. (See col 6 line 67-68) This is not precluded by the current language of Claim 59, from which this claim ultimately depends.) Both of these factors, namely carbon content and antistructuring agents, which reduce thickening, afterstiffening, and hardening, are consistent with preventing the rise of initial plasticity after 24 hours.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Friday 8:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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